

Subject programme

1. Subject name / subject module: **Rapid Prototyping**
2. Lecture language: **English**
3. The location of the subject in study plans:
 - Area or areas of the studies: **Computer Control Systems Engineering**
 - Degree of the studies: **2nd degree studies**
 - Field or fields (implementation of effects standard): **Mechatronics**
4. Supervision of subject implementation:
 - The Institute / Another unit: **Institute of Informatics and Mechatronics**
 - The person responsible for the subject: **Repka Michal, dr inž.**
 - People cooperating in the development of the programme of the subject:
5. The number of hours and forms of teaching for individual study system and the evaluation method:

Mode of study	Teaching activities with the tutor												Total
	Form of classes												
	Lecture	SOW	ECTS	...	SOW	ECTS	...	SOW	ECTS	...	SOW	ECTS	ECTS
Full-time studies	24	51	3										3
Part-time studies													
Credit rigor	Graded assignment												

6. Student workload – ECTS credits balance:

1 ECTS credit corresponds to 25-30 hours of student work needed to achieve the expected learning outcomes including the student's own work

Activity (please specify relevant work for the subject)	Hourly student workload (full-time studies/part-time studies)
Participation in lectures	24
Participation in laboratory classes	-
Independent study of the subject	34
Preparation to a final test	15
Participation in an exam / graded assignment	2
Total student workload (TSW)	75
ECTS credits	3
* Student's workload related to practical forms	0
Student's workload in classes requiring direct participation of academic teachers	24

7. Implementation notes: recommended duration (semesters), recommended admission requirements, relations between the forms of classes:
 - Recommended admission requirements – none.
 - Recommended duration of the subject is taken from the course plan.
8. Specific learning outcomes – knowledge, skills and social competence:

Specific learning outcomes for the subject		Form	Teaching method	Methods for testing of (checking, assessing) learning outcomes
Outcome symbol	Outcome description			
Knowledge				
K_W03	K_W03_ Student has a structured and theoretically founded knowledge in the field of materials useful for 3d printing, also in the field of single board computers and sensors.	Lecture	Expository methods	Final test, Student learning activities
K_W06	K_W06_ Student has an in-depth knowledge and understanding of 3D printing technology.			
K_W04	K_W04_ Student has a structured and theoretically founded knowledge in the field of controlling and construction of 3D printers.			
Skills				
K_U02	K_U02_ Student is able to use different software for slicing 3D models, configure and prepare 3d model for export.	Lecture	Expository methods	Final test, Student learning activities

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Assessment rules / criteria for each form of education and individual grades:

Activity	Grades	Calculation	To final
Final test/project	bdb (5)	5*80%	4,0
Attendance	on 70% of all classes	0,70 * 5 -> 3,5*20%	0,7
Final result			4,70

0 – 3.00	ndst	4.01 – 4.50	db
3.01 – 3.50	dst	4.51 – 4.7	db+
3.51 – 4.00	dst+	4.71 – 5.0	bdb

9. The learning contents with the form of the class activities on which they are carried out

a. Lecture:

1. Introducing to prototyping;
2. Arduino and Raspberry Pi as a base for Rapid Prototyping;
3. Arduino IDE;
4. Designing electronic devices: Fritzing software, Breadboards;
5. Building electronic devices;
6. Introducing to 3d Printing: Materials, Printers types, Using 3d printer;
7. Designing 3D models;
8. 8. Building own solutions.

10. Required teaching aids

- a. Lecture - multimedia projector
- b. Laboratory classes - specialist laboratory

11. Literature:

a. Basic literature:

Evans, B.: Practical 3D Printers. Apress 2012, ISBN: 978-1-4302-4393-9

Blum Jeremy: Exploring Arduino. Indianapolis, 2013, ISBN:978-1-118-54936-0

L. Wallach Kloski, N. Kloski : Getting Started with 3D Printing.1st Edition, Kindle Edition, 2019, ISBN-13: 978-1680450200

b. Supplementary literature:

Stephen W. Rock: 3D PRINTING GUIDE FOR NEWCOMERS. Independently published, 2019, ISBN-13 : 978-1794187436

Neil Wyatt: 3D Printing for Model Engineers. 1st Edition, ISBN-13: 978-1785004254

12. Available educational materials divided into forms of class activities (Author's compilation of didactic materials, e-learning materials, etc.)

13. Teachers implementing particular forms of education

Form of education	Name and surname
1. Lecture	Repka Michal, dr inž.
2. Laboratory classes	
3. Training	
4. Project classes	
5. Workshop classes	
6. Simulation game	
7. Language classes	